MEI® Banknote Recycler

BNR
User Guide

MEI Incorporated

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Published by:

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MEI® BNR - Banknote Recycler - User Guide

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VERSIONS

Version G1: First official release for customers.

Version G2: Chapter 4 Old Basic Troubleshooting removed
New labels added

TABLE OF CONTENT

SAFETY INSTRUCTIONS 4
STANDARDS CONFORMANCE 4

1. USER GUIDE 6
1.1. OVERVIEW 6
1.2. PRESENTATION 7
1.3. MAIN MODULE EXTERNAL INDICATORS 8
1.4. MODULES FRONT INDICATORS 8
1.5. SPINE INDICATOR 9

2. NORMAL OPERATIONS IN HOST MACHINE 10
2.1. LOCKS AND SECURITY PRINCIPLE 10
2.2. CASH-BOX HANDLING AND ARMING 12
2.3. LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTE . 14
2.4. CONFIGURATION THROUGH HOST MACHINE 19
2.5. BNR POWER UP 20
2.6. BNR RESET 22
2.7. BEZEL LED'S INDICATORS 24

3. BASIC TROUBLESHOOTING 25

4. EASY JAM CLEARING 26
4.1. IN THE SPINE 26
4.2. IN THE RECOGNITION SENSOR 27
4.3. IN THE RECOGNITION SENSOR TO SPINE INTERFACE 28
4.4. IN THE POSITIONER, AT THE INLET 29
4.5. IN THE LOADER CASSETTE 30
4.6 AT THE CASHBOX PUSHER PLATE 31

ERROR REPORT 32

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SAFETY INSTRUCTIONS

Expected use conditions: The MEI BNR product validates, denominates and stores banknotes. The MEI BNR is intended to be integrated as a peripheral within a Host Machine.

IMPORTANT WARNING - HEAVY MATERIAL

MEI™ BNR can weigh more than >**25 kg (>55 lb) when completely assembled**.

SAFETY INSTRUCTIONS

Before installing the BNR into a Host Machine, turn off all power.

When installing or removing electronic boards observe all ESD precautions to prevent damage.

Beware of hot surfaces!

LASER SAFETY STATEMENT

This product has been tested to and is found to be in compliance with Class 1

Led/Laser product according to IEC 60825-1

«Safety standard for laser products».

STANDARDS CONFORMANCE

MEI BNR series products operate at Safety Extra Low Voltage level (SELV) as defined in standard EN60950-1 «Safety of information technology equipment». They may be designed into processing machines covered by this standard and complying with IEC 60950-1 or EN 60950-1.

EMC notice: this digital device does not exceed the Class A limits according to EN 55022 and IEC/CISPR 22 limits for radio interference. In a domestic environment the User may be required to take adequate measures.

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EC Declaration of Conformity

Document Number 20199-003110023-EC/G2

MEI herewith declares that : **MEI BNR series Banknote recyclers**

- is intended to be incorporated into machines covered by European directives.
- does comply with the provisions of the following European directives :

2004/108/EC	Electromagnetic Compatibility
2006/95/EC	Low Voltage
2002/95/EC	Restriction of Hazardous Substances - RoHS (as amended)

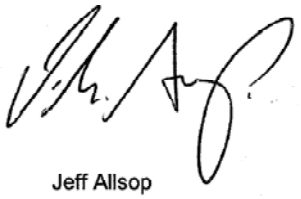
The products have been assessed by application of the following standards :

EN 55022 (1998)	Radiated emission for information technology equipment.
EN 55024 (1998)	EMC immunity characteristics for information technology equipment.
EN 60950-1 (2006)	Safety of information technology equipment.
UL 756 (2010)	File No.E57869 : Safety of coin and currency changers and actuators.

Our products are intended to be incorporated into automatic self-serve vending machines made by an OEM (Original Equipment Manufacturer). The latter equipment should also be declared to be in conformity with EC directives. The vending machine manufacturer integrating our module should observe the technical specifications and safety instructions supplied with the product.

Geneva, 2nd June 2010

Executive Vice-President



Jeff Allsop

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1. USER GUIDE

The intent of this document is to familiarize an Operator with the basic functions of the MEI BNR <Banknote Recycler>, to ensure the product is installed properly and to perform simple product upkeep. This manual does not discuss any product maintenance that requires tools or additional software. For more information on the BNR and about other operations, see the BNR Service Manual.

Convention used in this document and in the Service Manual:

- Paragraph with the icon is intended to identify safety concerns.

- Paragraph with the icon provides helpful instructions to make the BNR easier to use.

1.1. OVERVIEW

BNR - Banknote Recycler

The BNR processes multi-width international “street money” with the following basic functions:

1. Denomination, Validation and Acceptance of street banknotes for multiple countries,
2. Temporarily store the banknotes of the current transaction (Escrow capacity 15 banknotes),
3. Provide change to the consumer from temporary cash stores held in the Recyclers (RE) or Loader Cassette (LO) modules,
4. Store the banknotes in a permanent store, at the Cash-Box module (CB),
5. The BNR is powered by an external 24 VDC power supply, not included and not orderable from MEI,
6. The BNR communicates with the Host Machine through a USB connection.

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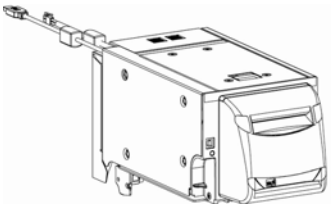
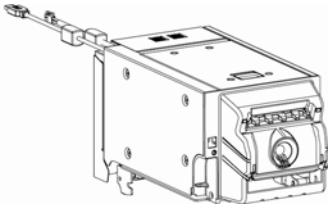
1.2. PRESENTATION

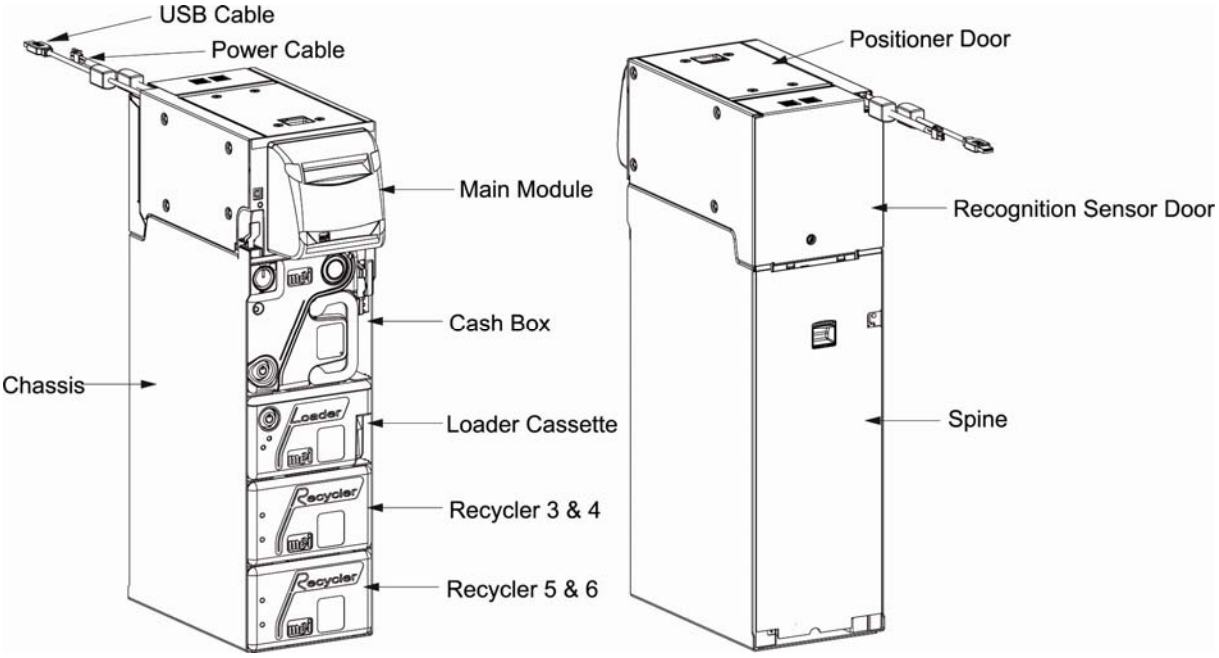
The BNR is composed of the following modules:

- Main Module: includes interface to the User (Inlet or “Bezel”), banknote validation system and a Bundler,
- Chassis: metal frame containing all the other modules with an Interlock System,
- Recycler module: device for storing and dispensing banknotes,
- Loader module: removable cash storage cassette for dispensing banknotes,
- Cash-Box module: a lockable secure removable cash storage cassette.

Standard Bezel version **Safety Metal Bezel version**







The required conditions for normal operations of the BNR are:

- Power cable and USB cable correctly connected,
- Positioner door, Recognition Sensor door and Spine door correctly closed,
- The Main Module correctly connected to the Spine (refer to “INSTALL THE MAIN MODULE ONTO THE CHASSIS” in the BNR Service Manual),
- Each module correctly inserted,
- Interlock System correctly locked (refer to “LOCKS AND SECURITY PRINCIPLE” in the “NORMAL OPERATIONS IN HOST MACHINE” chapter),
- The green unlocking lever is inserted completely,
- BNR Chassis properly linked to the local ground,
- BNR and Host machine are powered up and BNR is reset.

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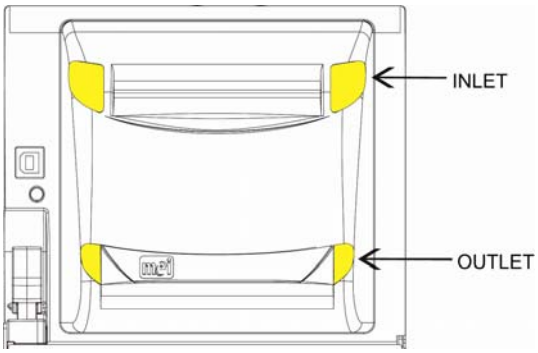
1.3. MAIN MODULE EXTERNAL INDICATORS

External indicators are located on the Bezel.

External indicators consist of two pairs of illuminated arrows, one pair pointing to the Inlet, the other pair pointing to the Outlet.

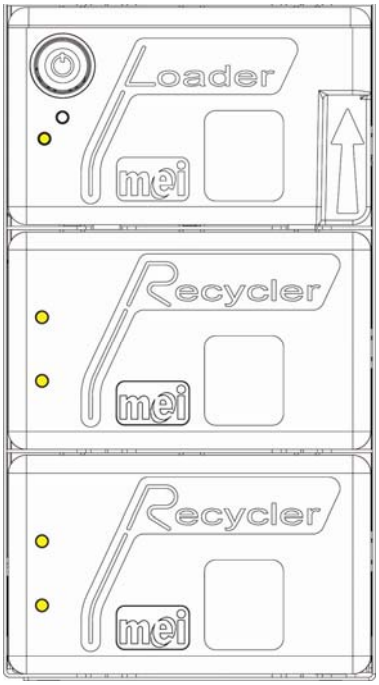
Inlet arrows can be illuminated green or red. Outlet arrows can be illuminated green only.

These arrows provide information about the transaction to the User, and can also indicate warning and failure conditions.



1.4. MODULES FRONT INDICATORS

Each BNR module has front located LED indicators giving its status. Each LED will illuminate green or red depending on the module status.



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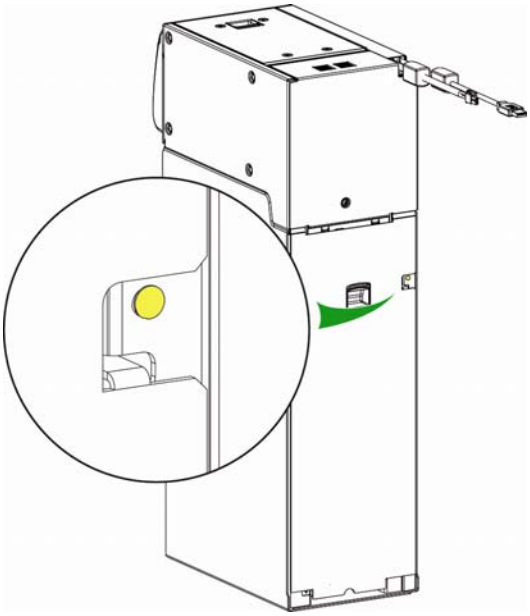
1.5. SPINE INDICATOR

The Spine has a LED indicator that provides its status. This indicator will illuminate green or red.



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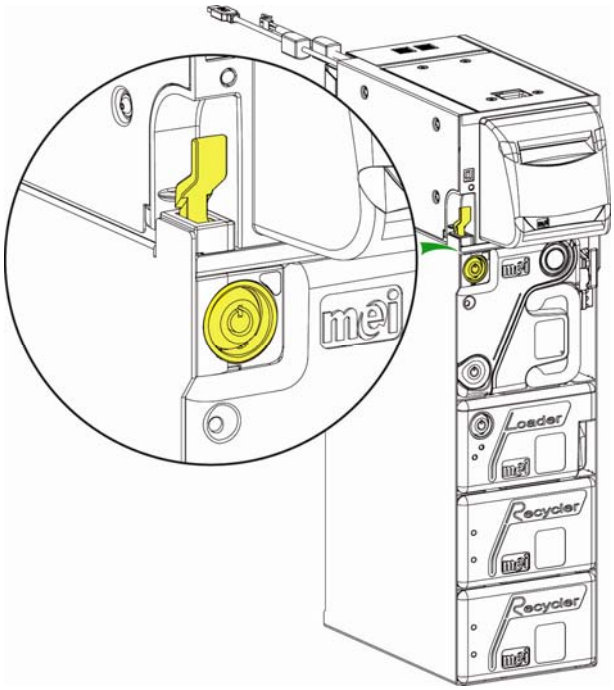
2. NORMAL OPERATIONS IN HOST MACHINE

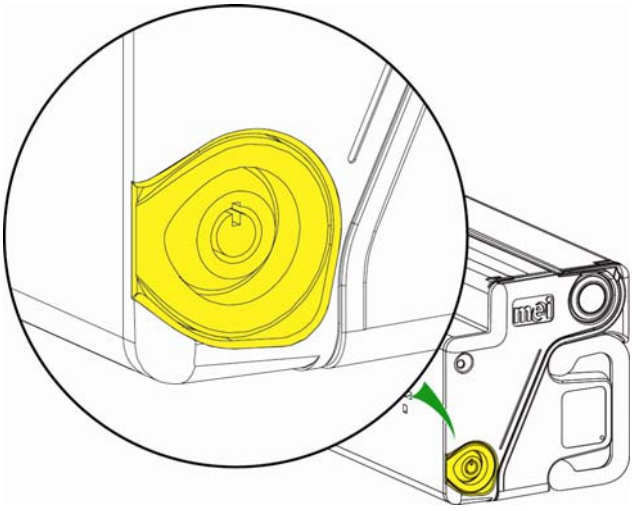
2.1. LOCKS AND SECURITY PRINCIPLE

The BNR can be secured with several locks to prevent unauthorised access to the stored money:

- Interlock System,
  A lock and a lever which secures all cash modules. The picture shows the Interlock System correctly locked.
  To release it, you need a key.



- Cash-Box,
  You need to release the Interlock System to remove the Cash-Box. To open the Cash-Box it must be removed and the module must be unlocked with a key.
  Once the cashbox is removed, it must be opened and emptied before it can be reinstalled in the BNR. The key is required to open, close and rearm it.



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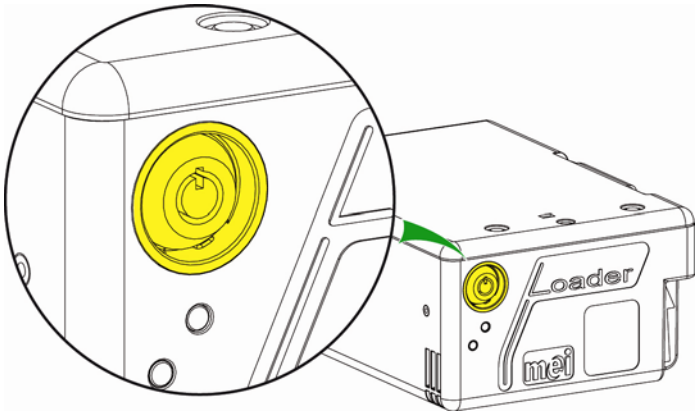
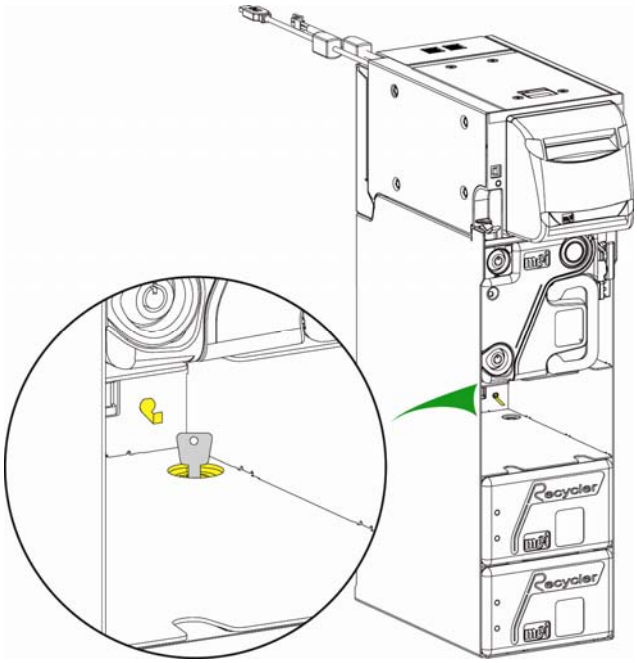
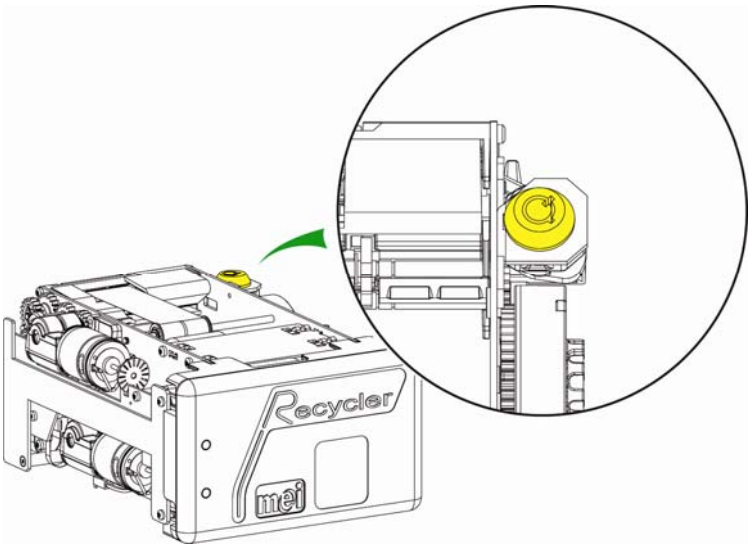
- Loader Cassette,
  You need to release the Interlock System to remove the Loader Cassette. To open the Loader Cassette it must be removed and the module must be unlocked with a key.
  The key is required to open and close it.



- Recycler,
  To remove a Recycler, you need to release the Interlock System and remove the Loader Cassette. Recyclers are locked in place with keys. Refer to the BNR Service Manual to remove the Recyclers.



Once the Loader Cassette is removed, you can see the Recycler lock.



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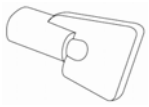
2.2. CASH-BOX HANDLING AND ARMING

To remove the Cash-Box, you need to release the Interlock System with its key.

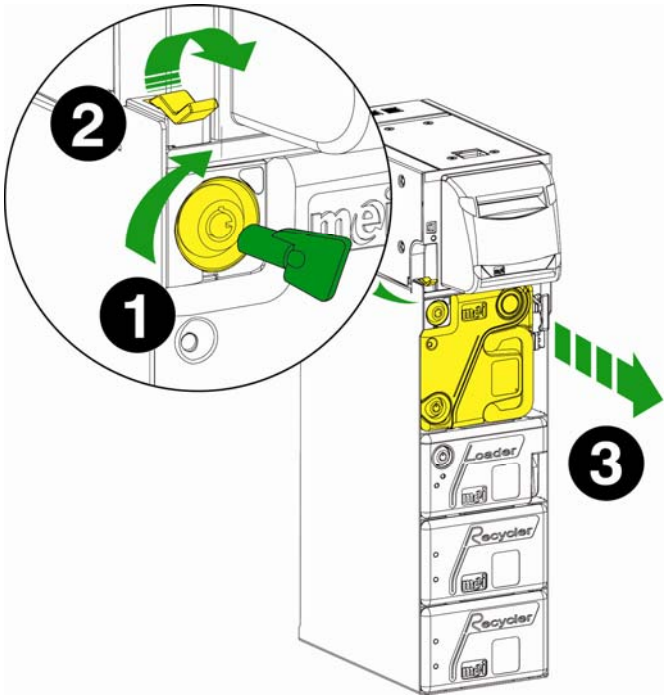
To open and rearm the Cash-Box, you need the key of the Cash-Box.



Warning, the Cash-Box is a module which needs to be rearmed once removed. Make sure that you have the key or another empty Cash-Box before removing it. If you do not have the key, you will not be able to replace the same Cash-Box.

1. Release the Interlock System with lock (1) and lever (2) using the key.

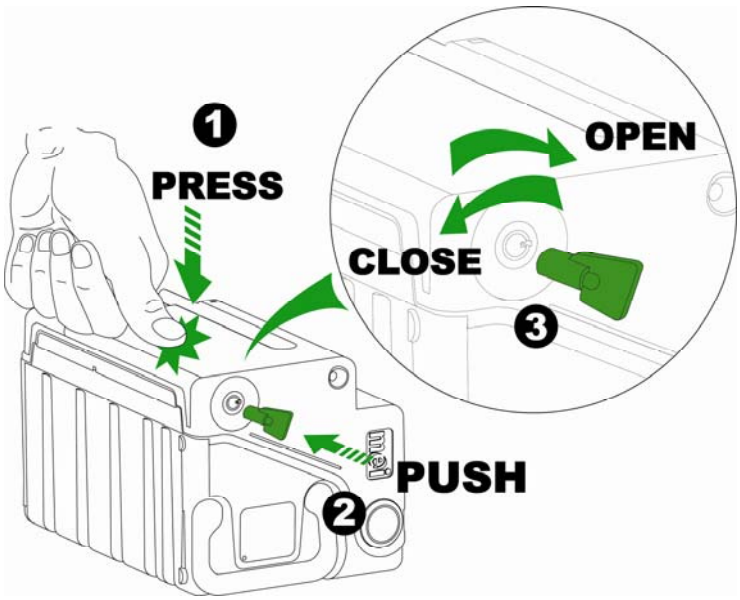
2. Remove the Cash-Box (3) by pulling it away from the BNR with the yellow handle.



3. To open the Cash-Box, press slightly on the Cash-Box (1), insert the key fully into the lock (2) and turn (3).

4. If banknotes are present, remove all banknotes.

5. To close the Cash-Box, press the Cash Box closed at (1), insert the key fully into the lock (2) and turn the key (3).



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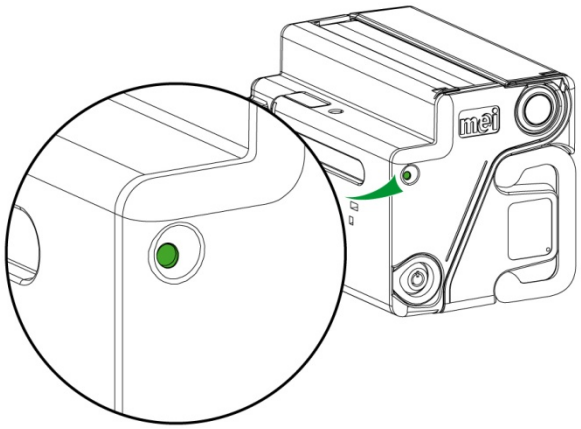
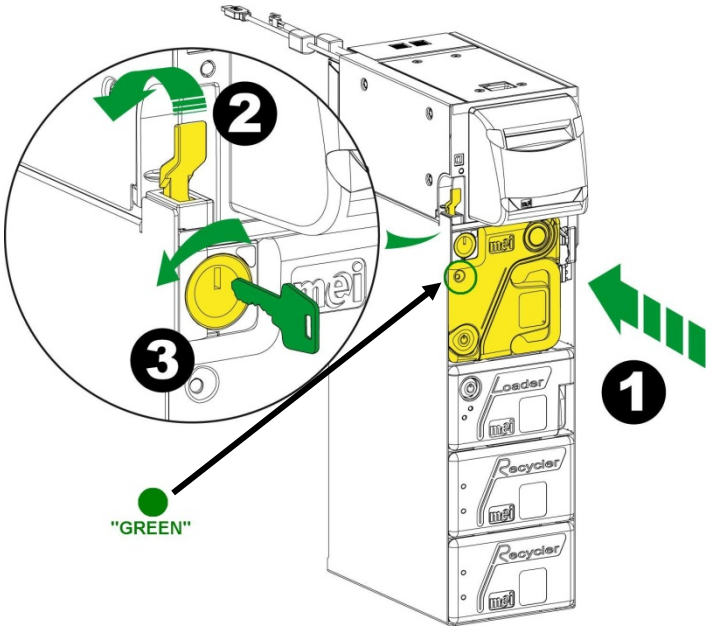
Caution, if the indicator is green the Cash-Box can be reinserted.
If the indicator is grey, the Cash-Box must be rearmed by opening it, emptying all banknotes, and then closing.



6. Install the Cash-Box (1).

NOTE: The Cash Box should install into the BNR with little force. If the cashbox does not sit flush in the BNR, first check that the interlock lever is unlocked and then check the cashbox arming indicator to ensure it is green. If it is not green, the cashbox will need to be rearmed by opening, emptying and closing.



7. Lock the Interlock System with lever (2) and lock (3) using the key.

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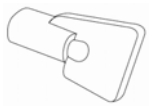
2.3. LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTE

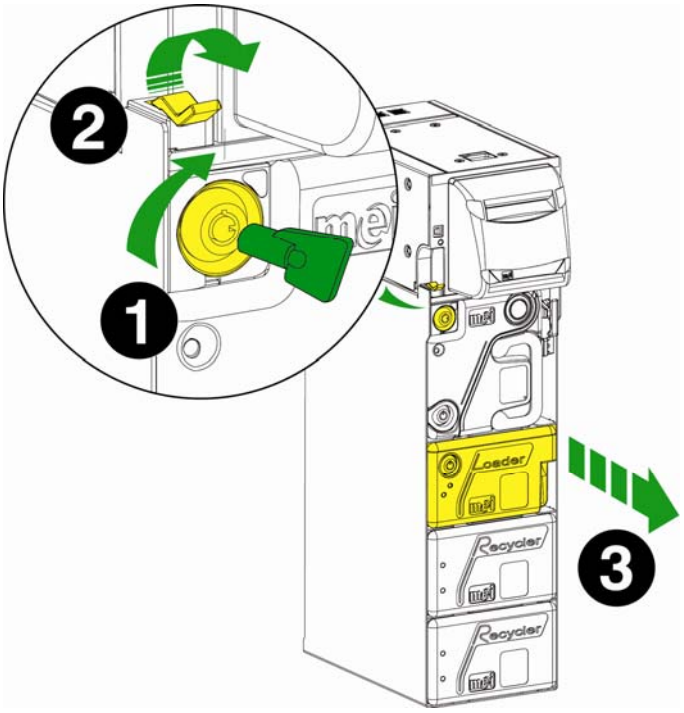
The following instructions explain how to fill the Loader Cassette with banknotes. Banknotes that are placed in the Loader Cassette must meet the banknote criteria detailed in Table 1.

To remove the Loader Cassette, you will need to release the Interlock System with its key. The key of the Loader Cassette is required to open and close it.

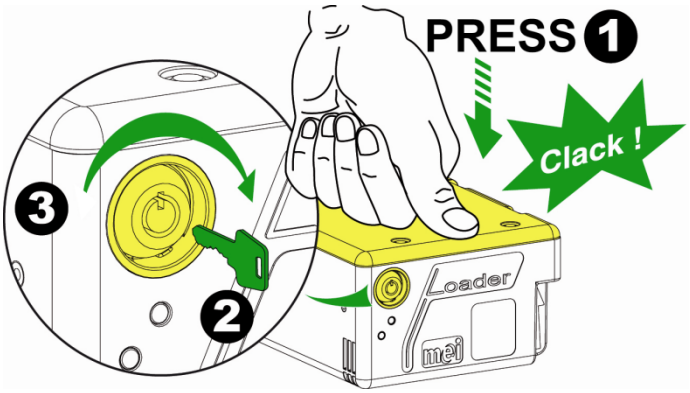


1. Release the Interlock System with lock (1) and lever (2) using the key.

2. Remove the Loader Cassette (3).



3. To open the Loader Cassette, press slightly on the box (1), insert the key (2) and fully turn the locking latch clockwise (3).



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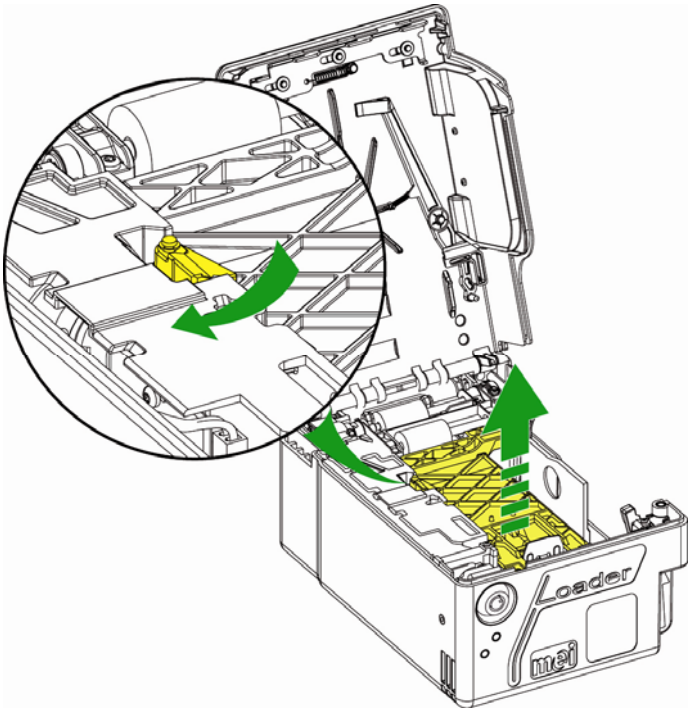
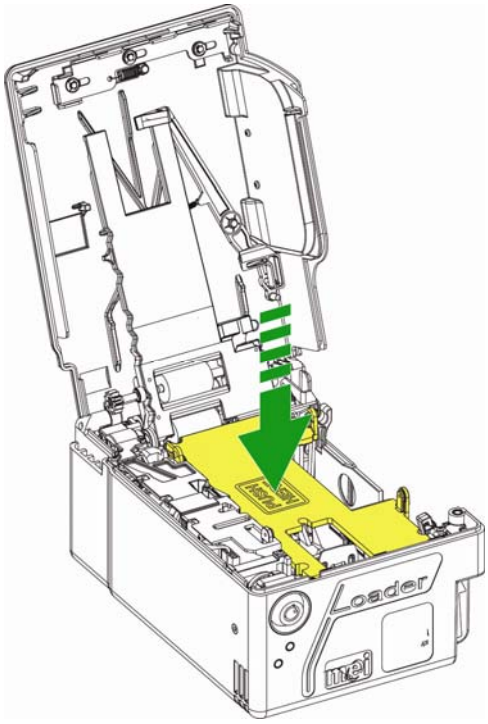
4. Fully open the door until it stops. Release the little yellow latch and lift the “max level detection plate”.



5. Push the pressure plate down to the stop. The pressure plate will lock at the bottom of the Loader Cassette.



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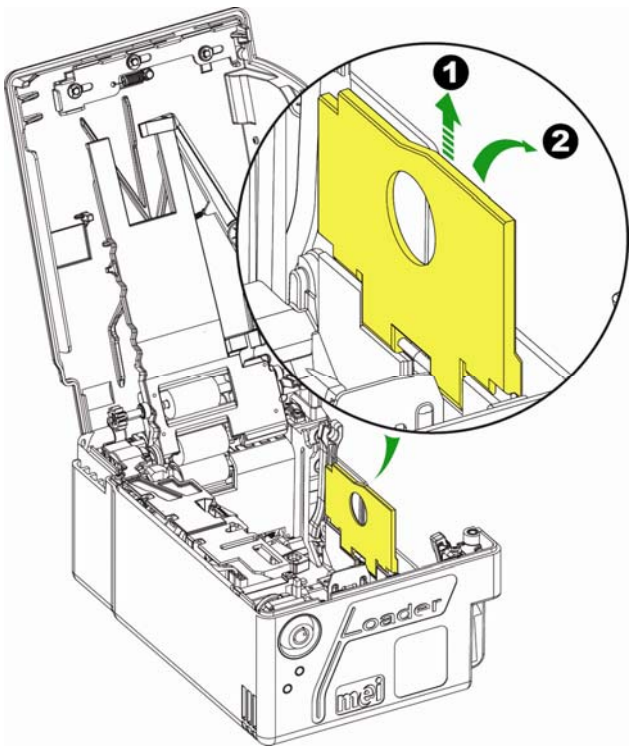
6. Lift (1) and flip (2) the lateral bill guide flap down. Ensure notes to be used in the loader meet all requirements of fitness in Table 1, then place a bundle of less than 250 banknotes into the loader. Reposition the lateral bill guide flap up.



Caution, MEI recommends to place the banknotes from the side.

NOTE: To see banknotes criteria for the Loader Cassette, refer to the Table 1.

NOTE: If the Loader is not configured for the banknotes you plan to load, refer to "ADJUST LOADER CASSETTE TO BANKNOTE SIZE" in the BNR Service Manual to adjust Loader Cassette to banknotes size.

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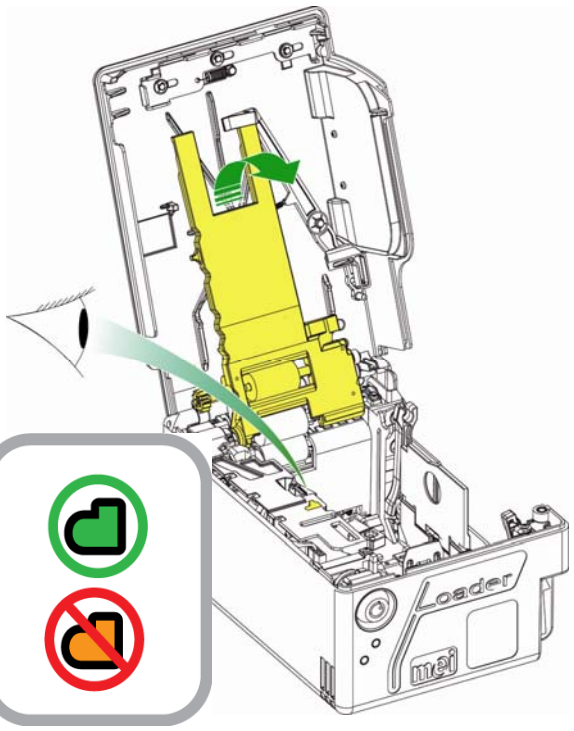
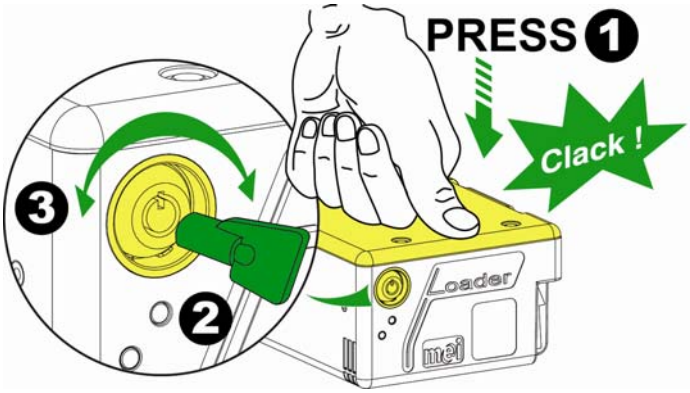
7. Reposition the “max level detection plate”.
With the max level detection plate down, check that the bill level flag is green. If the flag shows red remove some bills until the flag turns green with the detection plate down.



Caution, do not over fill the Loader Cassette and do not force the “max level detection plate” closed.

8. Close the Loader Cassette by slightly pressing the box (1), inserting the key (2) and slightly turning it clockwise (3), and then fully turn the key vertical in order to release the pressure plate mechanism.
A “clack” will occur after the key is turned vertical and ensures that the Loader Cassette is correctly closed.



9. Put the Loader Cassette back in place (1).

10. Lock the Interlock System with lever (2) and lock (3) using the key.

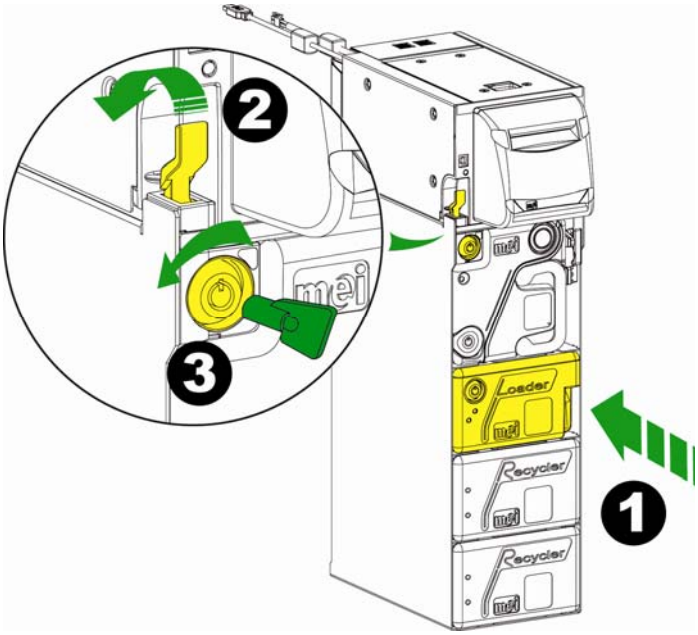


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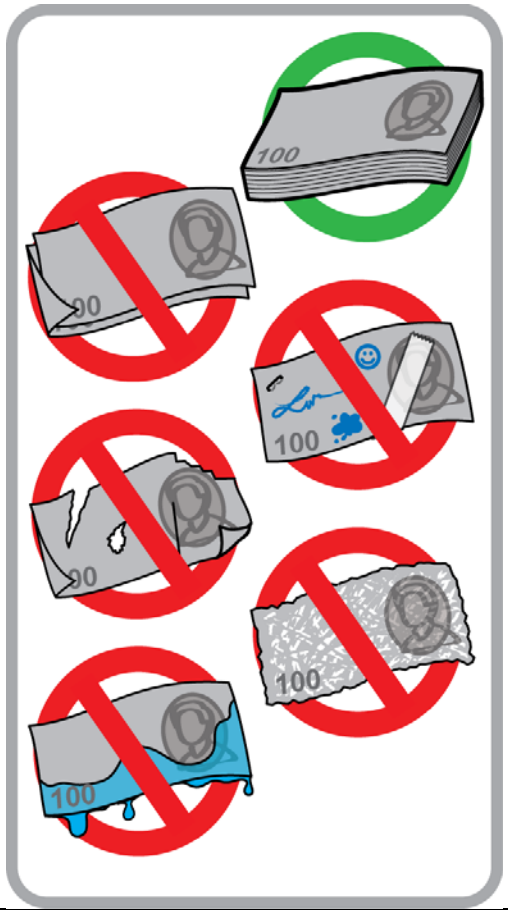
Table 1:
Capacity and banknote quality for the Loader Cassette

Maximum number of banknotes	250 +/- 50 notes Varies depending on the currency, the state of the banknotes and the climatic conditions.
Banknote width acceptance	Min. 60 mm to max. 81 mm (nominal) (+1 / -2 mm)
Banknote length acceptance	Min. 120 mm to max. 176 mm (nominal) (+1 / -2 mm)
Condition of banknotes accepted 	Cannot contain any of the following conditions: • More than ¼ of the length of the border missing or folded, • Holes, tears, folds, • Writing, stains, spots, or stamps larger than 100mm^{2,} • Tape, staples, pins, foreign matter attached to the banknote, • Machine washed, • Excessively worn, limp or wrinkled, • Two or more banknotes stuck together, • Wet or damp banknotes.

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2.4. CONFIGURATION THROUGH HOST MACHINE

The Host Machine may configure the BNR depending on the operator requirements.

For example:

- Enable or disable specific denominations or series of banknotes (active or inhibit).
- Loader Cassette: choice of denominations and number of banknotes filled by the Operator or stored by the BNR in the Loader Cassette,
- Recyclers: choice of recycled denominations and starting float level.

For more information, refer to the instructions provided by the Host machine manufacturer.

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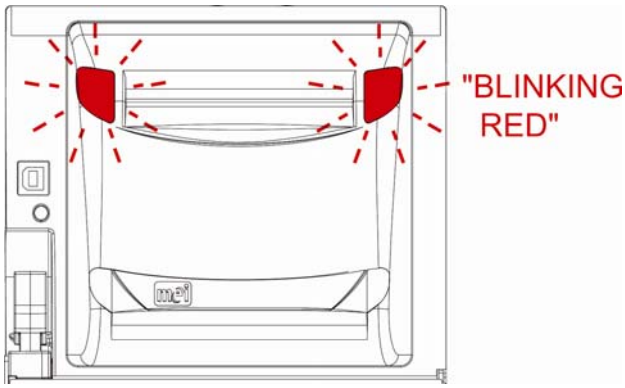
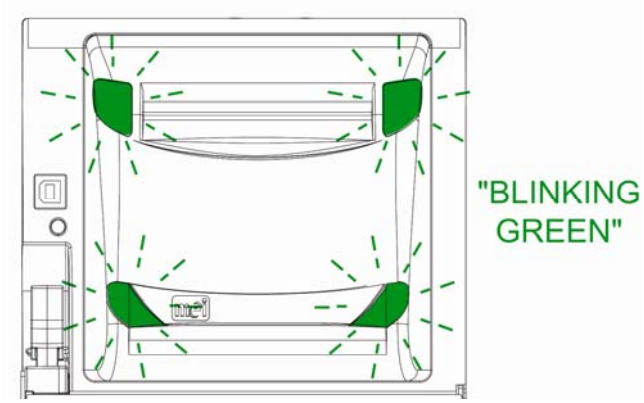
2.5. BNR POWER UP

When the BNR is powered up it performs a self test process and displays the following:

- Inlet arrows alternately BLINKING RED,



- Then 15 seconds later, Inlet and Outlet Arrows BLINKING GREEN,



- Finally all LED's of all modules SLOWLY BLINKING GREEN.

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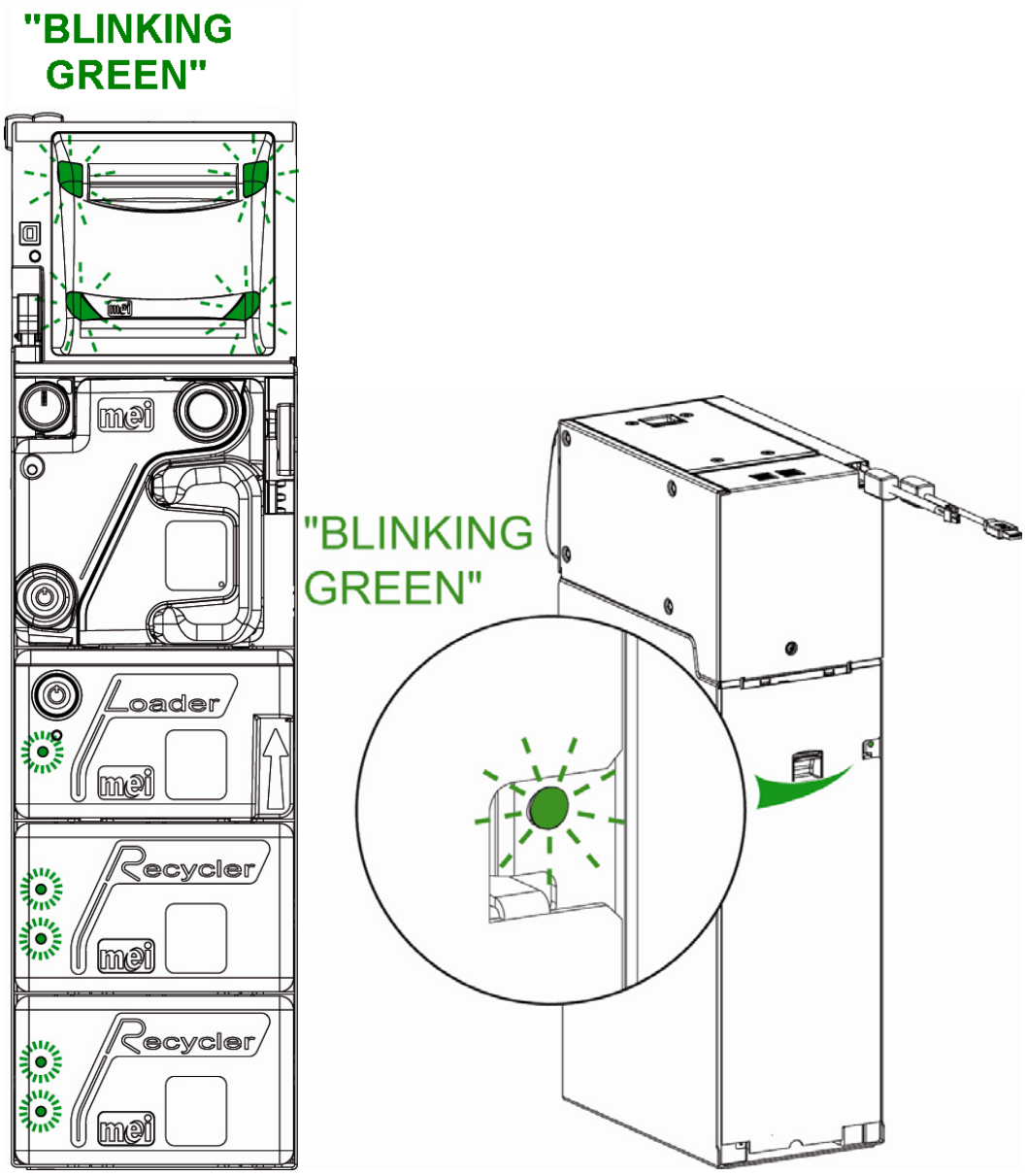

In this state a BNR “Reset” is required to bring the unit ON-LINE.

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2.6. BNR RESET

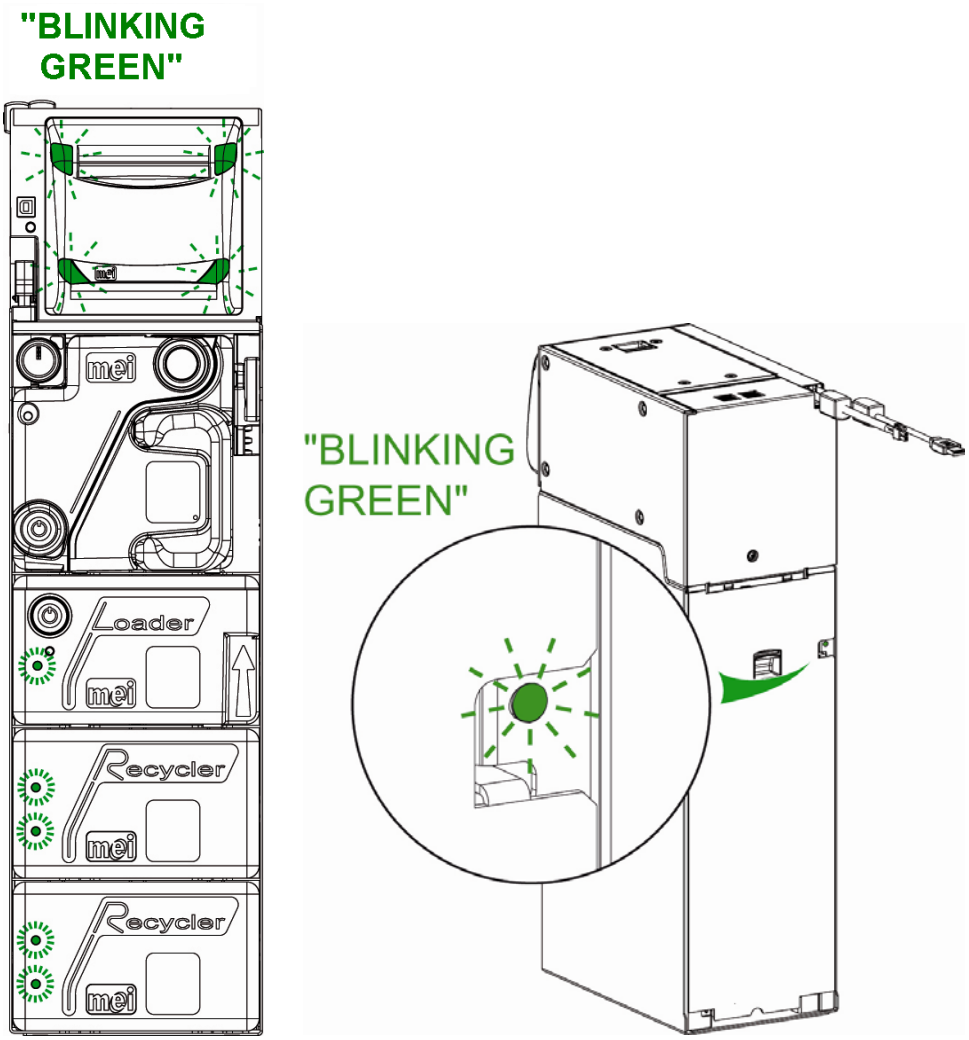
The reset sequence of the BNR takes approximately 15 to 25 seconds. It is dependent on the BNR configuration (number of modules). Reset automatically tests the BNR's electro-mechanical system for a failure or banknote in the transport system. If a banknote is found, it will be send the note to the Cash-Box.

NOTE: The first Reset cycle may take up to 1 minute 30 seconds.
If the Loader Cassette is empty, its LED indicator will blink Red. This will not affect the BNR readiness to accept cash.

During the reset sequence:

- You will hear running of the transport motors, belts and diverters being tested inside the BNR,

- You will see module LED's BLINKING GREEN SLOWLY.



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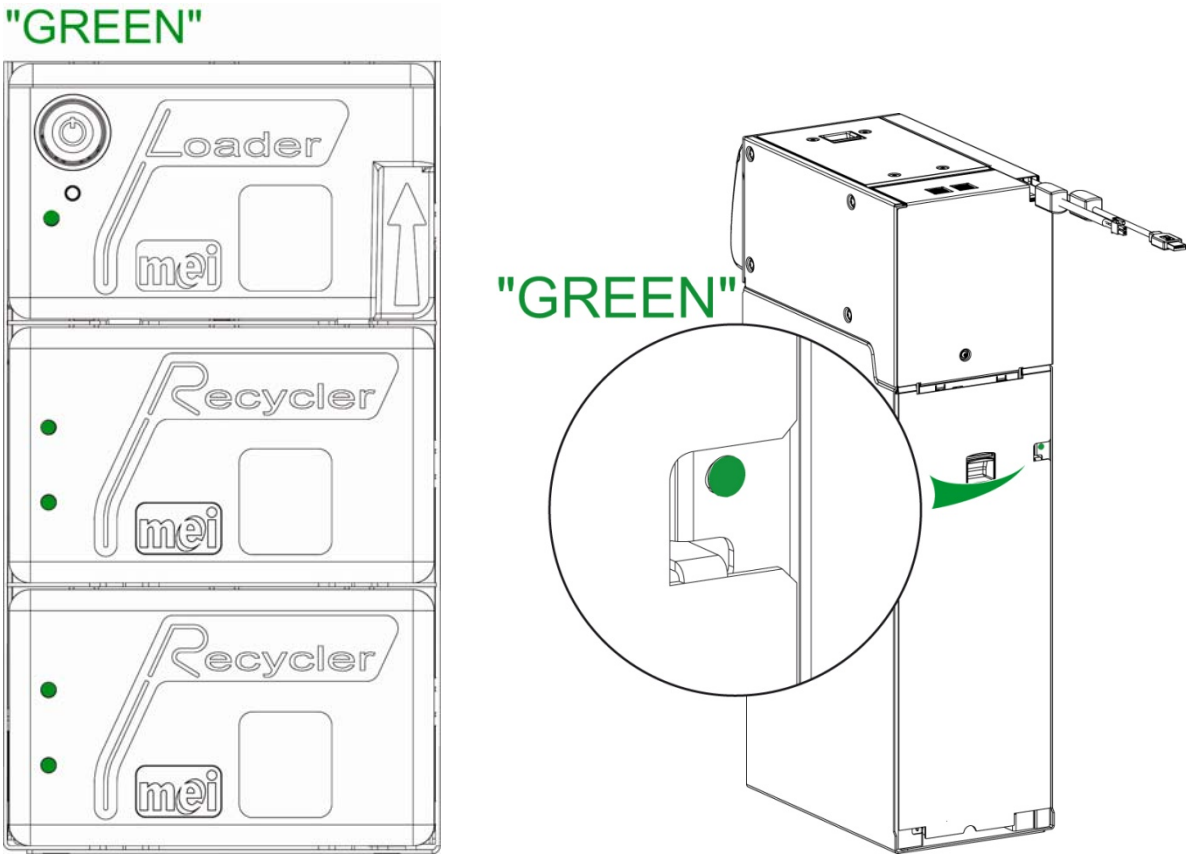
After resetting, the Main Module arrows lights turn off and all modules LED's will be SOLID GREEN.



If the reset sequence does not begin, make sure that:

- The Power cable and USB cable are correctly connected,
- Positioner door, Recognition Sensor door and Spine door are correctly closed (refer to "PRESENTATION" in the "USER GUIDE" chapter),
- Each module is correctly inserted,
- Interlock System is correctly locked (refer to "LOCKS AND SECURITY PRINCIPLE").

If one or several modules LED's do not turn to solid green, refer to "BASIC TROUBLESHOOTING".

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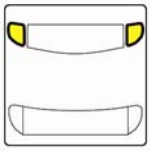
2.7. BEZEL LED'S INDICATORS

		**System / Module Status**	**You have to**
Off	Off	Insertion disabled	Take no action
GREEN	Off	A banknote can be inserted	Insert a banknote
GREEN	Off	A banknote returned to the Inlet	Pull the banknote out
Off	GREEN	Banknote are given out at the Outlet	Withdraw the banknotes

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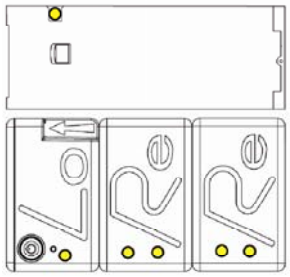
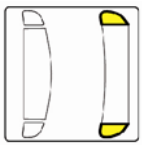
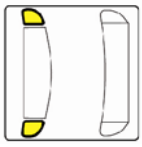
3. BASIC TROUBLESHOOTING

The basic troubleshooting is made by observing the several indicators of the BNR's modules. This troubleshooting is valid for the Firmware version 1.0.0.

External Indicator – FW version 1.0.0									System / Module Status	You need to
	-	-	-	-	-	-	-	GREY ●	Cash-Box full or not rearmed	Empty the CB, rearmed it, refer to "CASH-BOX HANDLING"
	Off	GREEN ● x1	GREEN	RED ● x1 Long (1 sec.)	RED ● x3 Fast continually	RED ● x3 Fast	RED ●	-	Operational	Take no action
	Off	GREEN ● x1	Off	Off	Off	Off	Off	-	Locked	Take no action
	Off	GREEN ● x1	Off	Off	Off	RED ● x3 Fast	RED ●	-	"Reset" required	After Switch-on, have the BNR to "Reset"
									Bill Storage not OK *(Loader only)*	Fill the Loader Cassette with banknotes
									Cash type Status not OK *(Re, Lo)*	Configure the Module
									Remove Bill in Transport *(jam, stopped, bill error)*	Clear the Jam, refer to "EASY JAM CLEARING" or refer to the Service Manual
									Not Operational *(wrong module, OOS, transport error)*	Require a "Reset" command

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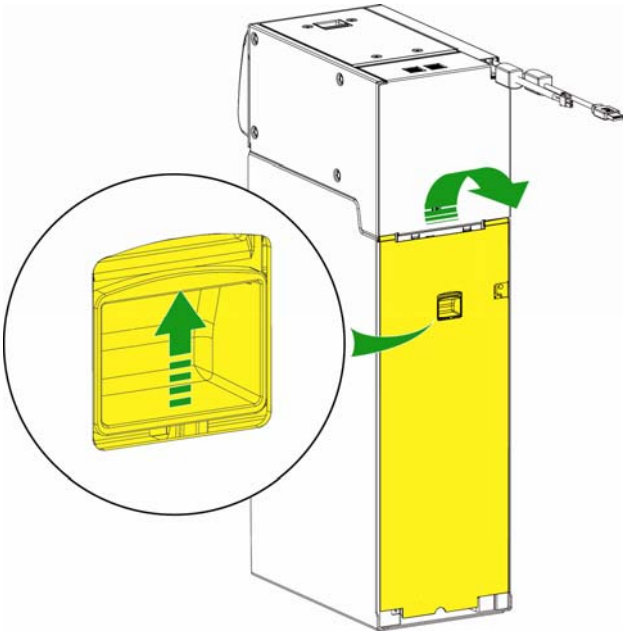
4. EASY JAM CLEARING

It may happen that a banknote is jammed in the BNR.
The following cases of jammed banknotes are easy to clear.

For more difficult cases of jammed banknotes, refer to “ADVANCED JAM CLEARING” in the BNR Service Manual 67902-5-044.

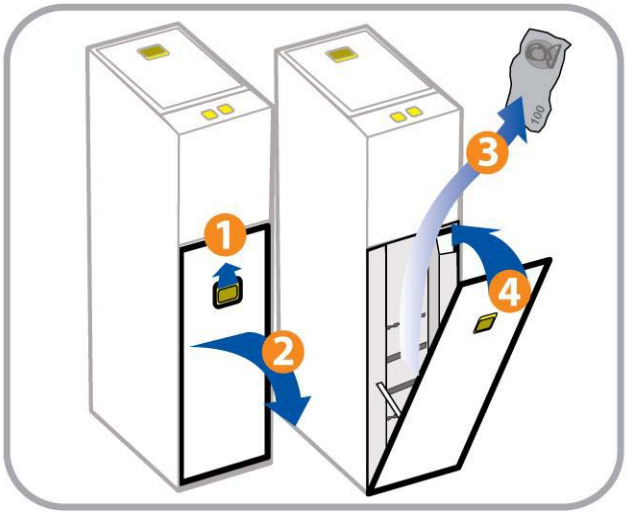
4.1. IN THE SPINE

1. Open the Spine door: lift and hold up the yellow button and pull the door.



2. Carefully withdraw the banknote, take care that the banknote does not fall behind the BNR.

3. Close the Spine door



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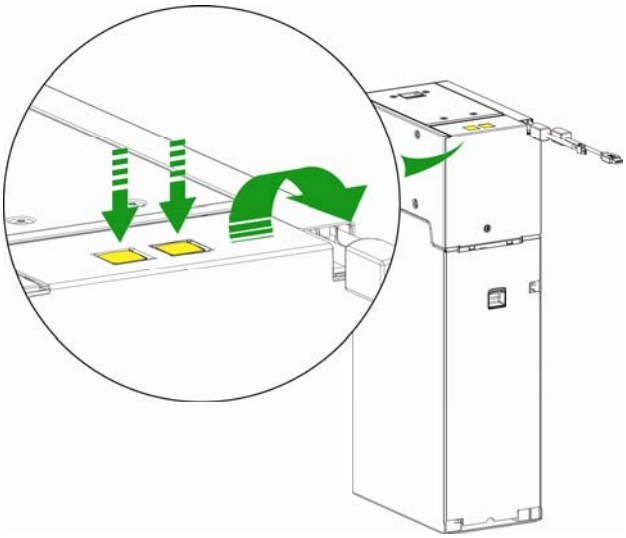
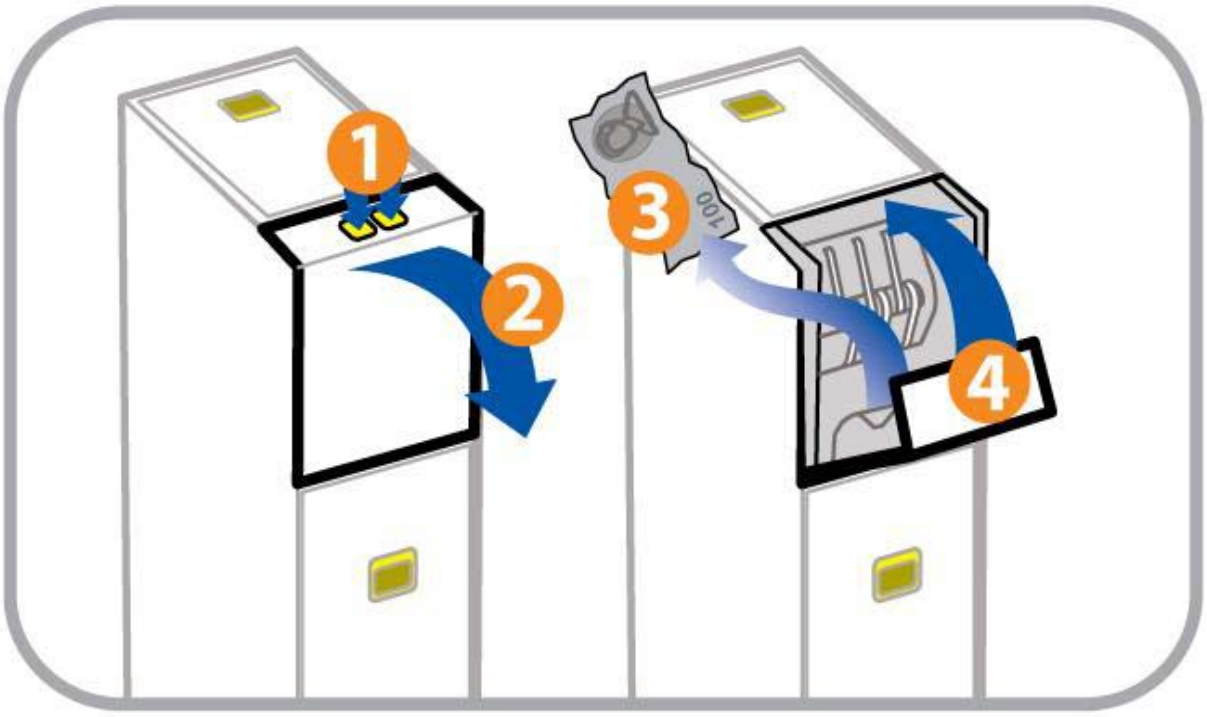
4.2. IN THE RECOGNITION SENSOR

1. Open the Recognition Sensor door. Push on the two yellow buttons and pull the door.



2. Carefully withdraw the banknote.

3. Close the Recognition Sensor door.



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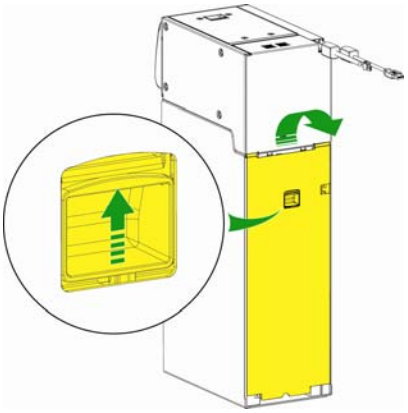
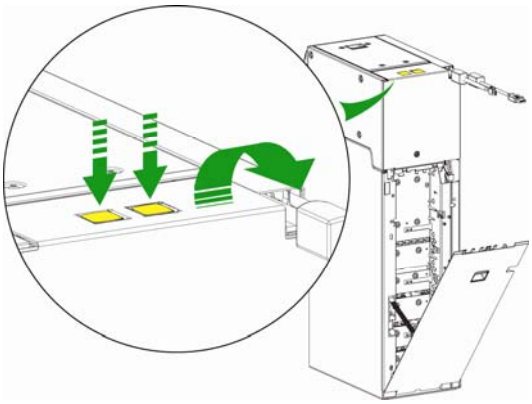
4.3. IN THE RECOGNITION SENSOR TO SPINE INTERFACE

1. Open the Spine door. Lift and hold up the yellow button and pull the door.

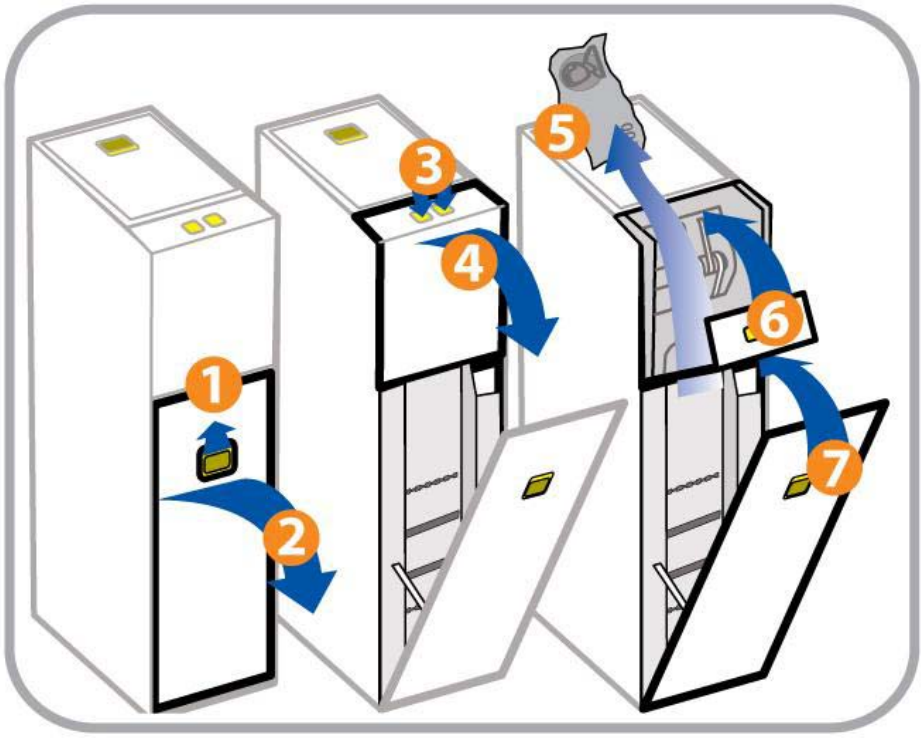


2. Open the Recognition Sensor door. Push on the two yellow buttons and pull the door.



3. Carefully withdraw the banknote.

4. Close the Recognition Sensor Door first and finally the Spine door.



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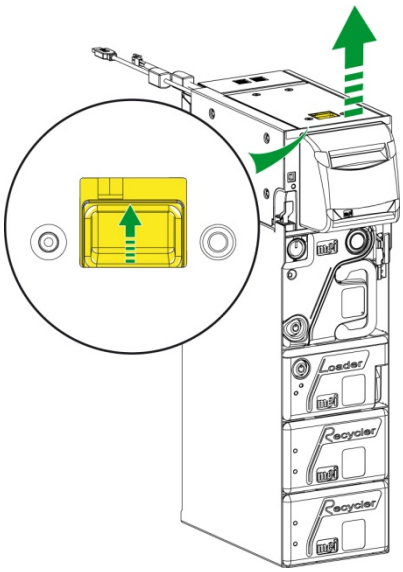
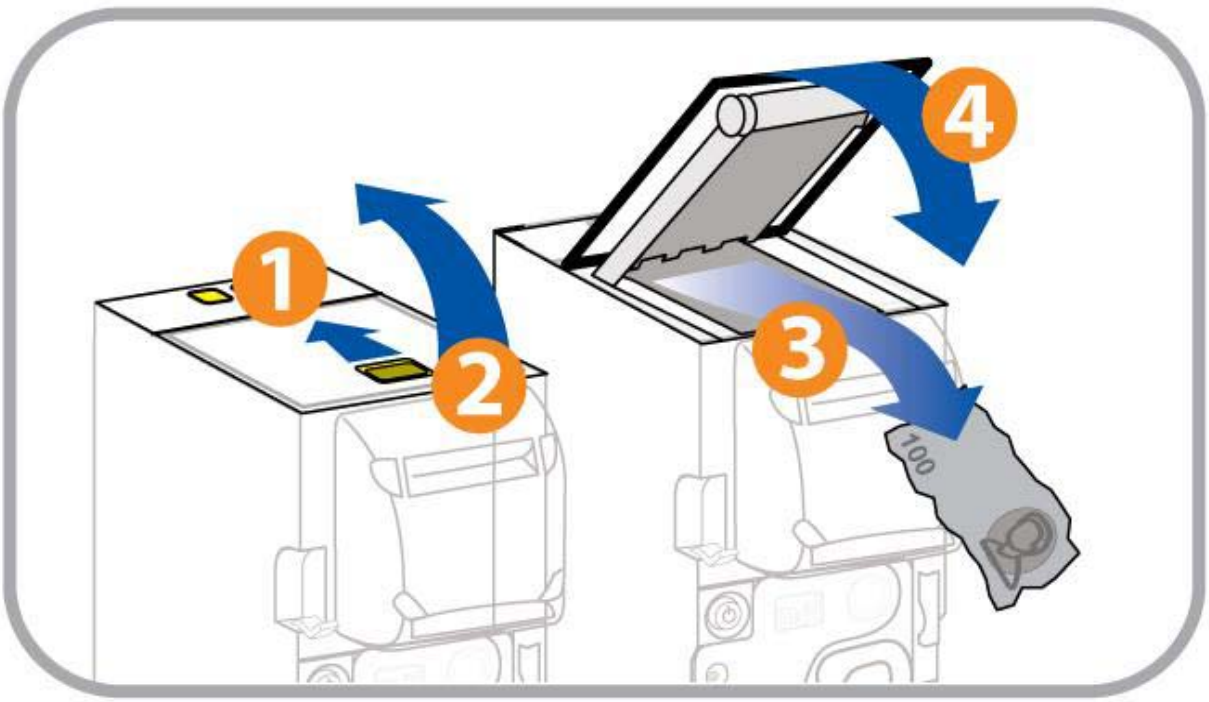
4.4. IN THE POSITIONER, AT THE INLET



1. Open the Spine door, then open the Recognition Sensor door, and finally open the Positioner door. Lift and hold up the yellow button and pull the door.

2. Carefully withdraw the banknote.

3. Close the Positioner door, close the Recognition Sensor door and finally close the Spine door.



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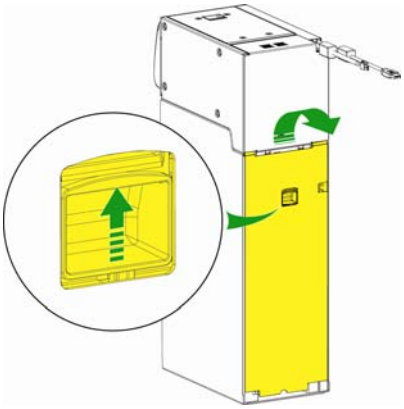
4.5. IN THE LOADER CASSETTE

1. Open the Spine door to check if the banknote is jammed in exiting the Loader

2. If you see the banknote, carefully withdraw it.

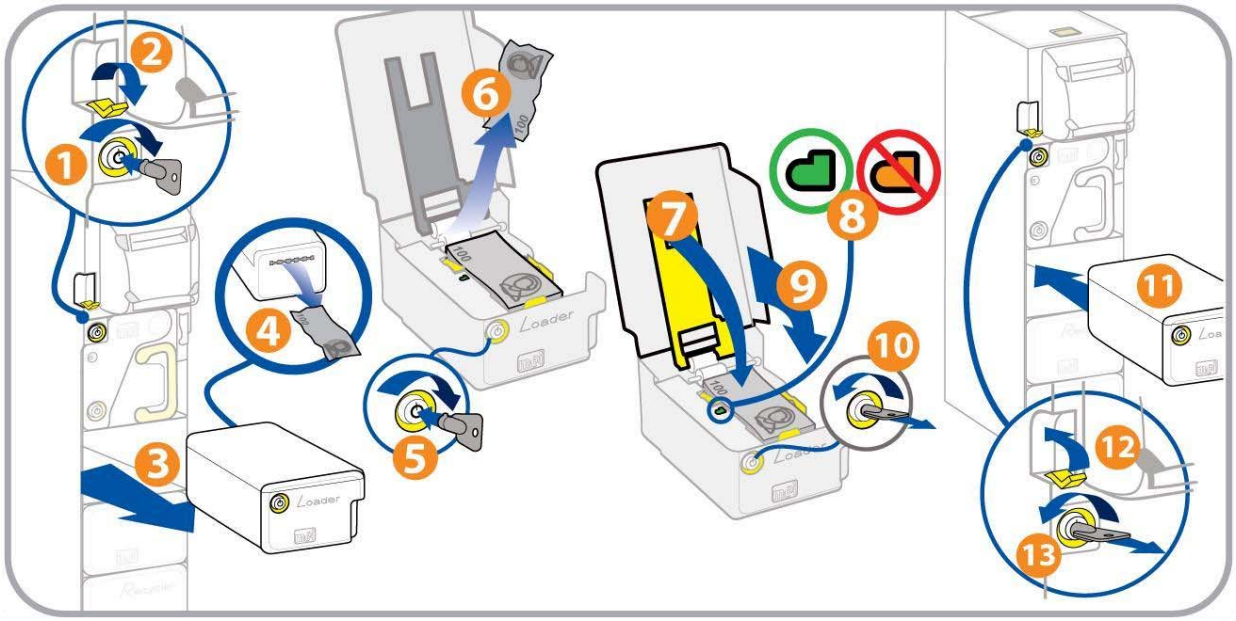


3. If you don't see the banknote, close the Spine door.

4. Remove and then open the Loader Cassette, refer to "LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTES" in the "NORMAL OPERATIONS IN HOST MACHINE" chapter.

5. Carefully withdraw the banknote.

6. Close and install the Loader Cassette, refer to "LOADER CASSETTE HANDLING, USING AND QUALITY OF BANKNOTES" in the "NORMAL OPERATIONS IN HOST MACHINE" chapter.



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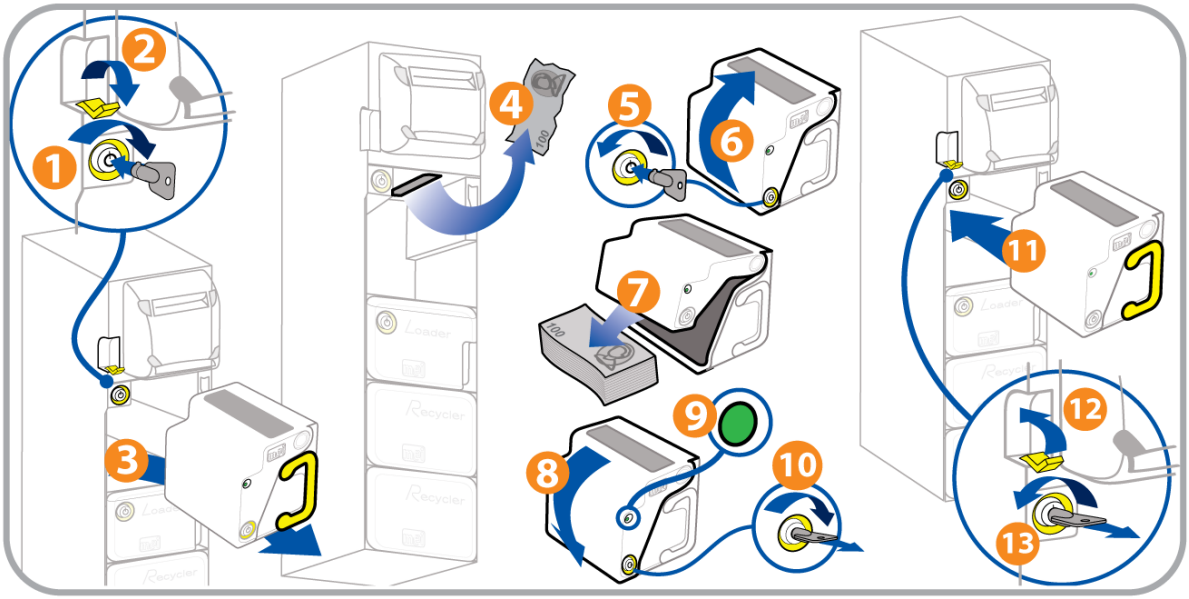
4.6 AT THE CASHBOX PUSHER PLATE

1. Remove Cashbox per instructions in section 2.2 above.
2. Inspect the BNR pusher plate located inside the BNR at the top of the opening where the Cashbox was removed from.
3. If you see a banknote, carefully remove it.
4. The Cashbox must be opened, emptied and rearmed before it can be re-installed in the BNR.
5. Replace the rearmed Cashbox.



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ERROR REPORT

N°:
RMA N°:

Name of company : _____

Date of intervention : _____ Time : _____

Name of person on duty : _____

BNR Type : _____ N°: _____ Version : _____

N° Main Module : _____ N° Chassis : _____

Host machine Type : _____ N° : _____ Version : _____

Location : _____ Position : _____

REPORT

Diagnostic (file name) ☐ _____

Pictures (file name) ☐ _____

Problem reported : _____

_____

_____

Problem found : _____

External aspect : _____ Vandalism : YES ☐

Work carried out : _____

_____

_____

Repair status : Error cleared ☐ Error not cleared ☐ Unit exchanged ☐

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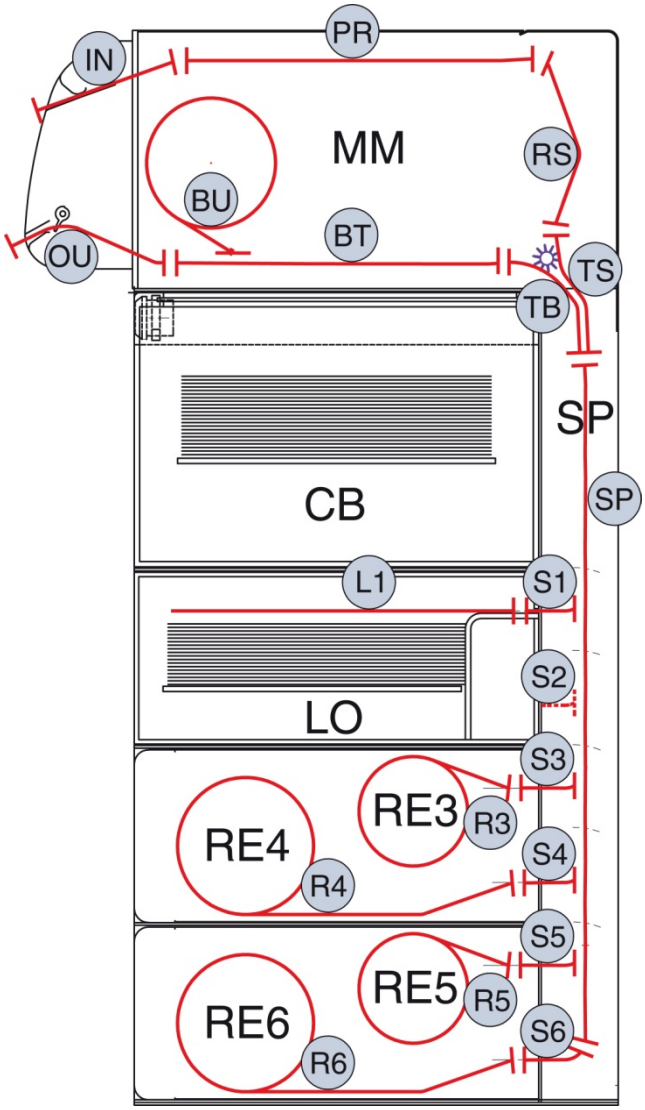
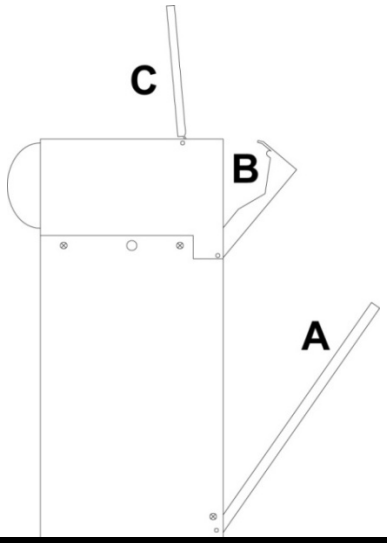


Area	
IN	
OU	
PR	
RS	
TS	
TB	
BT	
BU	
SP	
S1	
S2	
S3	
S4	
S5	
S6	
L1	
R3	
R4	
R5	
R6	

Opening order



Note			
Stopped			
Jammed (crumpled)			
Belts off			
Yes		No	
Condition of the note			
Old		Dirty	
Limp		Taped	
New		Clean	
Stiff		Torn	
Folded, dog-eared			
Wet			

Flashing	O	S	1	2	3	R	G
MM Inlet							
MM Outlet							
Cash-Box						g	
Spine							
Loader							
Recycler 3							
Recycler 4							
Recycler 5							
Recycler 6							

"O" = OFF "S" = Solid
"1" = x1 long flashes
"2" = x3 fast flashes continually
"3" = x3 fast flashes
"R" = Red "G" = Green "g"=Gray

Module removed

MM – Main Module
MSN : _____ ☐

CB - Cash-Box
MSN : _____ ☐

SP - Spine
MSN : _____ ☐

LO - Loader Cassette
MSN : _____ ☐

RE-3&4 - Recycler
MSN : _____ ☐

RE-5&6 - Recycler
MSN : _____ ☐

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NOTES

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